



NUCLEAR ENERGY INSTITUTE

## **Testimony for the Record**

**By**

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**Before the**

**Committee on Government Reform**

**Subcommittee on National Security, Emerging Threats,  
and International Relations**

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**TESTIMONY**

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**BEFORE THE  
NATIONAL SECURITY, EMERGING THREATS  
AND INTERNATIONAL RELATIONS SUBCOMMITTEE**

**COMMITTEE ON GOVERNMENT REFORM  
U.S. HOUSE OF REPRESENTATIVES**

**SEPTEMBER 14, 2004**

Chairman Christopher Shays, Ranking Member Dennis Kucinich, and distinguished members of the subcommittee, I am Marvin Fertel, senior vice president and chief nuclear officer at the Nuclear Energy Institute (NEI). I am honored to address the issues before this subcommittee today. As requested, I am here to discuss the nuclear energy industry's longstanding strengths—and its leadership—in American industrial security and how we have implemented yet more improvements in nuclear power plant security programs over the past three years.

NEI is responsible for developing policy for the U.S. nuclear industry. NEI's 270 corporate and other members represent a broad spectrum of interests, including every U.S. electric company that operates a nuclear power plant. NEI's membership also includes nuclear fuel cycle companies, suppliers, engineering and consulting firms, national research laboratories, manufacturers of radiopharmaceuticals, universities, labor unions, and law firms.

My testimony will address the following three issues:

- Nuclear power plants were the most secure industrial facilities in the United States before the Sept. 11, 2001, terrorist attacks. Nuclear plants are designed to withstand a broad range of events from tornadoes to earthquakes. Studies also have shown plants can withstand aircraft impacts on buildings and structures that directly house nuclear fuel, as well as ground-based attacks.
- The industry, responding to the Nuclear Regulatory Commission, has made nuclear power plants even more secure since September 2001. The industry has spent in excess of an additional \$1 billion on security improvements and has increased its security forces by nearly 60 percent by hiring approximately 3,000 more security officers since Sept. 11. The NRC and industry have conducted numerous studies to ensure that plants are secure. The security at nuclear power plants is now at the limits of a private security force's capabilities.

- Further increases in the security requirements that are imposed upon the owners of nuclear power plants will have serious policy implications for overall homeland security. The nuclear industry supports legislation included in the energy bill conference report, that will enhance security at our plants and encourage Congress to enact those measures into law.

## **NUCLEAR POWER PLANTS ARE KEY TO ENERGY SECURITY AND CLEAN AIR**

Prior to discussing the security provided at our plants, it is important to remind this subcommittee and Congress of the immense importance of nuclear energy to our country. Nuclear energy is a vital part of our nation's diverse energy portfolio, producing electricity—safely and cleanly—for one of every five U.S. homes and businesses. The United States remains the world leader in nuclear energy, with 103 reactors generating 764 billion kilowatt-hours of electricity in 2003—more than *all* of the electricity used in Great Britain and France combined. Our 103 reactors produce about one-fourth of the world's total nuclear-generated electricity.

Nuclear energy is the only large source of electricity that is both emission-free and readily expandable. The industry's exemplary safety record, outstanding reliability, low operating costs and future price stability make nuclear energy a vital source of power today and for the future. Nuclear energy is critical to U.S. energy security and diversity. Before the oil shocks of the early 1970s, nuclear power provided just 4 percent of our electricity supply, and oil provided about 20 percent. The situation is now reversed, as nuclear energy essentially has phased out oil use in the electricity sector. It would take 1.4 billion barrels of oil to generate as much electricity as nuclear energy produced in 2003, one-third of all the oil we import every year.

The steady growth of nuclear energy over the past three decades has produced enormous environmental and clean-air benefits. Nuclear energy now generates three-fourths of all emission-free electricity generation in the United States and is making significant reductions in harmful emissions into the atmosphere from the industrial sector. Nuclear power plants produce electricity that otherwise would be supplied by oil-, gas- or coal-fired generating capacity and thus avoid the emissions associated with fossil-fueled capacity.

Nuclear plants consequently have value in terms of compliance with various clean-air initiatives. In effect, emissions prevented through the use of nuclear energy are equivalent in value to those reduced as electricity is produced by other sources. Nuclear plants likewise help prevent the production of additional greenhouse gases, the most important of which is carbon dioxide (CO<sub>2</sub>).

In 2002, President Bush proposed a voluntary program to reduce greenhouse gas intensity by 18 percent by 2012. Greenhouse gas "intensity" is a measure of tons of carbon per \$1 million of gross domestic product. If current trends continue, U.S. greenhouse gas intensity will decrease 14 percent by that year—about 106 million metric tons, NEI estimates.

The U.S. nuclear industry is making the largest contribution by a single industry to greenhouse gas reduction. The nuclear industry estimates that it will add 10,000 megawatts through uprates and improved performance by 2012. This additional capacity will prevent the emission of about 22 million metric tons of carbon equivalent over the same period—more than one-fifth of the president's carbon reduction goal.

U.S. nuclear power plants prevented more than 750 million tons of carbon dioxide in 2003, which is equivalent to eliminating the CO<sub>2</sub> emissions from nine of 10 passenger cars in the United States—or about 134 million vehicles.

Nuclear power is essential in meeting clean air regulations. In 2002, U.S. nuclear power plants avoided the emission of about 3.4 million tons of sulfur dioxide (SO<sub>2</sub>) and about 1.4 million tons of nitrogen oxide (NO<sub>x</sub>). The requirements imposed by the 1990 Clean Air Act Amendments called for reductions of SO<sub>2</sub> emissions from the electric power sector between 1990 and 2002 by 5.5 million tons per year and reductions of NO<sub>x</sub> emissions by 2.3 million tons per year. Thus, in a single year, using nuclear power plants to generate electricity has eliminated nearly as much in emissions as has been achieved over a 12-year period by all other sources combined.

According to a report issued last year by the Environmental Protection Agency and the Ozone Transport Commission, nuclear energy was one of the most significant compliance tools for reducing NO<sub>x</sub> emissions in northeastern and Mid-Atlantic states. The EPA assessment found that energy companies have been shifting electricity production from fossil-fueled power plants to emission-free nuclear power plants to help comply with federal air pollution laws.

#### **NUCLEAR POWER PROVIDES ENVIRONMENTAL AND ECONOMIC BENEFITS TO THE NORTHEAST**

The two nuclear reactors at the Millstone site produce over 50 percent of Connecticut's electricity and thus are vital to Connecticut's economic vitality. In addition, the six nuclear reactors in New York produce about 28 percent of that state's electricity, and Massachusetts receives over 13 percent of its electricity from nuclear power. Overall, the Northeast receives nearly a third of its electricity from nuclear power.

In addition, nuclear energy also is an environmental imperative for reducing greenhouse gases in specific regions of the country. New York is a good example of this phenomenon. New York's greenhouse gas emissions from fuel combustion decreased 1 percent from 1990 to 2002, despite a growth in population and the number of automobiles on the road. The increased production from the state's six nuclear power plants offset the need for electricity production at other power plants and therefore reduced greenhouse gas emissions during that period.

In 1990, the FitzPatrick, Ginna, Indian Point and Nine Mile Point nuclear power plants generated more than 24 billion kilowatt-hours of electricity in New York. By 2000, nuclear energy production increased by 60 percent, to more than 40 billion kilowatt-hours. This increase in nuclear production allowed for a decrease in the use of other fuels and offset an increase in emissions from the rising use of natural gas. The result is an overall 23 percent reduction in greenhouse gas emissions from the electricity sector.

As the New York example shows, nuclear energy is vital to our nation's clean-air programs. Expanding nuclear energy production through continued efficiency gains and building new nuclear plants would further enhance the role of nuclear energy in our environmental goals. Recent studies by the Earth Institute at Columbia University and the Massachusetts Institute of

Technology underscore the importance of nuclear energy and renewable energy sources in meeting energy and environmental goals that are inextricably linked.

Nuclear power plants are also vitally important to the local economies where they are located. According to a study prepared by NEI, the Millstone power plant, in New London County, Conn., employs nearly 1,500 people at salaries 50 percent higher than the local average. The plant paid \$17 million in state and local taxes, including nearly one-fourth of all taxes paid to Waterford, Connecticut. In addition, the plant generated nearly 15 percent of all of New England's electricity needs and helped keep down energy prices in New England. Millstone did all of this without producing airborne emissions typical of other large-scale generation sources.

A similar study for the Indian Point Energy Center found that it employs nearly 1,700 people at significantly higher salaries than the averages for the surrounding counties. The economic activity generated by Indian Point creates an additional 1,200 jobs in the area. The center paid more than \$25 million in taxes within Westchester County.

The Indian Point Energy Center meets approximately 11 percent of the total energy needs of the state of New York and plays a vital role in maintaining regional air quality. Estimates indicate that in the absence of Indian Point, the state's NO<sub>x</sub> emissions would be 19 percent higher and SO<sub>2</sub> emissions would be 11 percent higher because fossil-fuel plants would offset Indian Point's production.

Some recommend closing the Indian Point Energy Center because of their concerns regarding security, but such a move would sacrifice a critical source of power for the state and needlessly reverse progress New York has made in reducing greenhouse gas emissions. EPA has determined that all five counties that surround Indian Point already do not comply with federal air rules. Taking Indian Point off the New York electricity grid would worsen air quality and unnecessarily drive up the cost of electricity to consumers and businesses.

The economic impact studies mentioned above are available on NEI's Web site at [www.nei.org](http://www.nei.org).

#### **NUCLEAR PLANTS HAVE THE BEST INDUSTRIAL SECURITY IN THE NATION**

Nuclear power plants are the most secure, commercially owned facilities in the country. We are justifiably proud of our security programs and the example they provide for America's industrial infrastructure. And we recommend that members of this subcommittee and any member of Congress visit one of our plants. I urge you to visit any plant in America that you choose, as they must all meet the same high standards set by the NRC.

Compared to other commercial facilities, nuclear power plants start with a clear advantage in the area of security. They were built to withstand certain natural events, such as earthquakes, hurricanes, tornadoes, fires and floods. They are massive structures with thick exterior walls and internal barriers of reinforced concrete. As such, the structures provide a large measure of protection against attacks. In addition, the "defense-in-depth" philosophy used in nuclear facility design means that plants have redundant and separated systems to ensure safety. That is, active

components, such as pumps, have backups as part of the basic design philosophy. This provides a capability to respond to a variety of events, including aircraft attack.

Our difficult-to-penetrate structures are only part of our security strategy. Nuclear power plants also have inner and outer perimeters with increased security at each level. We have physical barriers to protect against vehicle assaults, including truck bombs. Those perimeters are guarded by trained and armed professionals, who use hardened defensive fighting positions. Access to the vital areas of our plants is strictly controlled and constantly monitored.

Our employees are subjected to comprehensive background checks, a systematic fitness-for-duty program and a continual behavioral observation program to identify potential alcohol or drug abuse problems. Every plant also has extensive plans and arrangements to coordinate with state and local entities. In addition, every plant must maintain a comprehensive emergency evacuation plan.

I have also made available a DVD produced by NEI on nuclear power plant security. Although many details of our security are considered “safeguards” and thus not open to public viewing, this DVD provides an excellent overview of the security employed at every nuclear plant. In addition, I have attached two NEI fact sheets on nuclear plant security and plant security improvements since Sept. 11. The security DVD and the fact sheets also are available on NEI’s Web site at [www.nei.org](http://www.nei.org).

We believe that our plants’ combination of hardened structures, perimeter protection, access controls and other security measures greatly exceeds the security provided at other commercially owned facilities, including many facilities that pose an equal and often greater threat to public safety from a terrorist attack than do nuclear power plants. The robust design and construction of nuclear plants and the multiple safe shutdown systems incorporated at each site make the likelihood, even from a terrorist attack, of a radiological release that would threaten public health extremely unlikely and well below other societal risks.

#### **NRC, INDUSTRY TAKING DECISIVE STEPS TO VERIFY PLANTS ARE ADEQUATELY PROTECTED**

The industry and the NRC have undertaken a series of decisive steps to reassess security programs and implement additional measures. These steps have included:

- a reassessment of industry security programs and the regulations governing them
- a plant-by-plant review of security programs, with every company responding
- significant investment in manpower and capital improvements to strengthen plant security
- major studies to reassess our plants’ ability to withstand attack.

It is important to recognize the roles that the industry and our regulator, the NRC, play in providing security at our plants. The NRC mandates that each plant provide sufficient security to protect against the “design basis threat” (DBT), a regulatory definition of the abilities of a potential attacking force. Although this is accomplished by detailed orders and regulations, it is the responsibility of each company at each site to meet such requirements. The determination of

the potential risk to terrorist attacks—requiring the cooperation and coordination of our intelligence-gathering and federal law enforcement agencies—is a governmental function.

We recognize that there can be threats to our plants that are greater than what is defined by the DBT. Although our security would provide an initial deterrence, at some point such threats are the responsibility of the federal government, which has full intelligence, interdiction and military response capabilities. Since Sept. 11, 2001, the Department of Homeland Security (DHS) and the NRC have recognized the importance of coordinating federal, state and local authorities with the industry to best defend against such an attack. The DHS and NRC have conducted a pilot program to integrate the response planning around nuclear plant sites. The industry is participating in and fully supports this effort.

After 9/11, the NRC and the nuclear industry conducted studies to determine the vulnerability of nuclear power plants to various types of terrorist attacks. Although a nuclear plant would pose a well-defended, hardened target for any potential terrorist attack, these studies analyzed the risk to public health and safety that would result from a successful terrorist attack using a commercial airplane and assuming a successful ground assault on a nuclear plant. In both cases, the damage to the plant and the economy of the surrounding area would be significant, yet the actual risk to the public due to a release of radiation from the plant was determined to be extremely low.

#### **THE NRC AND INDUSTRY HAVE SYSTEMATICALLY INCREASED AND IMPROVED SECURITY SINCE 9/11**

As NEI noted last year before this committee, nuclear power plants, even before Sept. 11, 2001, were our nation's most secure private industrial facilities. Since then, we have greatly bolstered security at our plants—making them even more secure. Over the past three years, the nuclear energy industry has cooperated and worked with the NRC to review nuclear plant security completely, and many improvements have been implemented as a result.

Our first set of improvements took place on Sept. 11, 2001, when the NRC ordered all nuclear power plants to remain on high alert. We limited access to our plants. We expanded our protective perimeters. We constructed temporary barriers and discontinued non-essential activities. In addition, nuclear power plants immediately began hiring additional security personnel and upgrading overall security.

In February 2002, the NRC issued a number of interim security orders. These orders, in effect, increased the DBT, and the level of security at nuclear power plants was significantly increased in several areas. The industry, complying with the NRC orders, instituted additional measures, such as:

- extending and fortifying security perimeters
- increasing patrols within security zones
- installing new barriers to protect against vehicle bombs
- installing additional high-tech surveillance equipment
- strengthening security coordination with local, state and federal agencies to integrate approaches among the entities—a position the industry continues to support.

For the next several months after the issuance of the orders, the industry worked closely with the NRC to develop a guidance document to ensure consistent and thorough implementation of the new security requirements.

Following the completion of its top-to-bottom review and its study of the potential threats to nuclear power plants, the NRC issued the final DBT in April 2003. At that time, the NRC issued orders that enhanced training and qualification of security officers, improved access controls and established work-hour limits. These orders required licensees to develop and submit new security plans, training and qualification plans and safeguards contingency plans.

The new DBT increased security requirements on our plants in several ways. The potential vehicle bomb size was increased as was the number of terrorist attackers in a ground assault. The new DBT also increased the modes of attack to include water-borne assaults.

Each plant was ordered to make the necessary modifications to meet the new DBT by Oct. 29, 2004. To achieve this objective, the industry developed standardized templates for the new plans and obtained NRC concurrence on the templates for industry use. This innovative template approach not only assured the consistent implementation of the security orders but greatly facilitated NRC review of individual licensee security plans.

As a result of these new requirements, the number of security officers at our 64 plant sites has increased from approximately 5,000 to 8,000, an average of 125 officers per site. Other changes that can be found at every nuclear plant include physical improvements to provide additional protection against vehicle bombs, as well as additional protective measures against water- and land-based assaults. Every plant has increased security patrols, augmented security forces, added more security posts, increased vehicle standoff distances, tightened access controls, and enhanced coordination with state and local law enforcement.

NEI calculates that the collective cost of this additional security since September 2001 totals over \$1 billion. The physical improvements and equipment upgrades comprise the majority of this total, yet the industry also has spent hundreds of millions of dollars on additional personnel. NRC security spending has also increased and, as the industry funds 90 percent of the NRC's budget through user fees, the industry has paid more than \$70 million to fund the additional security efforts of its regulator.

#### **INDUSTRY HAS COMMISSIONED MAJOR STUDIES EXAMINING NUCLEAR PLANT ABILITY TO WITHSTAND ATTACK**

In early 2002, NEI asked EPRI—a nonprofit energy research institute—to analyze whether nuclear power plant structures that house nuclear fuel could withstand an intentional aircraft impact, like those of Sept. 11. Aircraft impact issues have been addressed in the licensing process for all 103 operating reactors, but those evaluations were conducted on the basis that the crash would be accidental. EPRI's independent study was conducted by experts in impact analysis related to commercial and military applications. Their results were peer-reviewed by an expert in the dynamic analysis of structures and a renowned structural analyst.



The EPRI study found nuclear power plant containment buildings and used fuel storage pools would protect reactor fuel even if the structures were struck by a fully loaded Boeing 767-400 flying at approximately the same speed as the airplane that crashed into the Pentagon. The study also found that such an impact would not breach the used fuel storage containers used at many plants to store used nuclear fuel outside a used fuel pool. Such a crash certainly would cause a significant amount of collateral plant damage, and no doubt would shut down the plant. However, the EPRI study concluded that such an event would not cause a release of radiation, because it would not breach reactor containment, nor would it cause the spent fuel pool to lose the cooling water that shields the fuel from the environment.

NEI also conducted a hypothetical study to determine the risk to public safety from a release of radiation assumed by a successful terrorist ground assault on a nuclear power plant. This study found that the risk to the public from a core damage accident caused by an armed terrorist ground attack on a commercial nuclear power plant is small. It is comparable to, or less than, the risk from other types of accidents postulated for U.S. commercial nuclear plants.

It is unlikely that a ground assault terrorist attack could successfully cause damage to a nuclear reactor because of plant owner capabilities to detect insider activities, physically deter attackers and mitigate accidents with operator actions and safety systems. The likelihood of severe release of radiation due to a damaged reactor is even lower, owing to the inherent strength of containment and radioactivity removal capabilities of containment and systems design. In other words, terrorists would not only need to overwhelm a plant's security forces, take over the plant and contend with an off-site response from local government authorities, they would need to figure out how to defeat primary and secondary shutdown systems and cause a reactor meltdown. Even then, they would still need to determine how to create a breach in a reinforced concrete containment building in order to achieve a radioactive release that could possibly reach the public.

Even if core damage and radiological release occur, our study also found that the public health consequences would not be catastrophic. The mean number of prompt fatalities is estimated at two people, and the mean number of latent cancer fatalities is estimated at less than 100, which is indistinguishable from cancer fatality risks from all causes within the population. For a terrorist group, determining another target instead of a nuclear plant that could be attacked with a greater likelihood of success and a much greater loss of life is not a difficult task.

It is our goal to make commercial nuclear power plants very unattractive targets for a terrorist group intent on causing loss of life. Our exceptionally strong structures and added security measures make a successful terrorist attack, even from the air, exceedingly unlikely. As shown by these studies, the chances that even a successful attack would actually cause a loss of life, other than from the attack itself, are also remarkably low, further reducing the likelihood that a terrorist would choose a nuclear power plant as a target. This is the case now, and we are committed to keeping it that way.

## **TREATMENT OF SECURITY THREATS BEYOND REGULATORY LIMITS**

When the NRC issued the new DBT in April 2003, it stated that security at nuclear power plants had been taken to the limit of what licensees can be expected to provide. The industry is fully committed to constantly maintaining and improving plant security as necessary, yet it agrees with the NRC assessment. We have taken industrial security to, and perhaps beyond, its logical limit. At some point, postulated threats, such as attacks by military-sized forces or by forces using advanced weaponry, are the responsibility of the federal government. Privately funded security forces have practical as well as legal limits on the force they can use and thus on their overall capabilities to defend against an attack.

The industry has supported several provisions that would clarify plant security officers' ability to use certain weaponry, as well as their ability to use deadly force. Clarifying these issues would help better define the roles and responsibilities of private entities and the government in providing security at our plants.

The industry has responded to concerns that there may be attacks beyond the capabilities of the security provided by the plant by coordinating its security efforts with local, state and federal governments. Although such coordination existed prior to Sept. 11, it has been substantially increased and made part of our overall security strategy. The industry has been coordinating with DHS and with state security directors to assure that its security is adequately assisted in the unlikely event of a terrorist attack.

The industry recently established a Nuclear Sector Coordinating Committee (NSCC) with DHS to provide a forum for integrating on-site and off-site resources for threats that exceed our stand-alone capabilities. The industry is fully committed to working with all levels of government in providing the best security possible to deter an attack and to provide the best possible response should one occur.

The industry stands ready to work with federal agencies engaged in homeland defense to share its lessons learned and to provide insights into the role of commercial entities in protecting our critical infrastructure.

## **FORCE-ON-FORCE EXERCISES HAVE BEEN SIGNIFICANTLY IMPROVED**

The industry has not only been improving its security, but has also been working to improve the testing of that security. Prior to Sept. 11, 2001, the NRC operated a program that ensured each plant had an adequate strategy for responding to the DBT with force-on-force drills. These drills were conducted at each plant roughly every eight years. The NRC's program prior to Sept. 11 had been criticized by outside groups for their adequacy in testing security and by the industry for a lack of consistency.

Although we do not consider a ground assault a likely mode of attack at a nuclear power plant, it is the only mode that can be tested with a force-on-force exercise that simulates an actual attack. As a result, it is important that these exercises are as realistic as possible and that they are

measured against a consistent set of performance standards. The new program is a rigorous and systematic approach that addresses each of these issues.

Each plant will now be testing its security multiple times each year. One of these drills at least once every three years will be evaluated by the NRC. The NRC has established standards for the qualifications of the adversary forces that participate in the force-on-force drills. Licensees must also conduct a similar test of each security shift once per year. The NRC also will take a more active role in each drill by reviewing the overall plan as well as viewing the drills at each plant. In this manner, the NRC can assure that its high standards are met.

The NRC also has established requirements for the capabilities and qualifications of our security forces. To avoid fatigue, the NRC has imposed limitations on the number of work hours of our security personnel.

The primary purpose of the force-on-force exercise is to test the defensive capabilities of the plant; however, an effective exercise hinges on the capabilities of the adversaries as well. To this end, the industry has established a Composite Adversary Force that is skilled in offensive tactics and has the training and qualifications to meet the NRC standard. This force will consist of full-time, highly trained, security experts. The adversary force will be used in the triennial NRC-evaluated exercises and will thus present a state-of-the-art challenge to our plants. In addition to evaluating the defensive capabilities of the plant, the NRC also will evaluate the adversary force to ensure a robust exercise. Through this program, assurance is further provided that our security forces can successfully respond to a dedicated adversary team.

We are unaware of any security forces for any private industry that are subjected to such rigorous testing that includes force-on-force drills using a full-time dedicated team.

#### **NUCLEAR PLANT SECURITY, PRAISED BY INDEPENDENT EXPERTS AND SOURCES**

Objective reviews from unbiased sources have almost uniformly praised our security as the best or among the best of any industrial sector. The industry's security has been recognized as excellent in independent assessments conducted by the Progressive Policy Institute, a panel of security and 14 infrastructure experts for The Washington Post, and by current and former law enforcement officials.

The Progressive Policy Institute, in a report on homeland security issued last summer, gave nuclear plant security its only "A" rating. When The Washington Post reviewed security in several U.S. private and government sectors a year after Sept. 11, a panel of experts gave the nuclear industry a rating of "A-/B+"—the second-highest rating in the survey. More recently, the National Journal, in a bipartisan survey, gave nuclear plant security its third-highest ranking.

The industry does have its critics, however. The Union of Concerned Scientists released a report last week that postulates a series of worst-case scenarios resulting from a terrorist attack. Riverkeeper, an advocacy group opposed to Indian Point, commissioned the report. Ed Lyman, the author of the report, purports to analyze the consequences of a radiation release resulting

from such an attack and dismisses the NRC assessments regarding the low probability of this type of event.

A team of industry technical analysts, including representatives from the Palo Alto, Calif.-based research institute EPRI, found that the report “is based on bad science masquerading as a complex analysis” and that it applied data from various sources “in a manner that is both unrealistic and inappropriate.” The team also noted that the report fails to take into account the extremely low probability of a commercial aircraft’s penetrating a plant containment wall, damaging plant components and the reactor within. Without taking into account such a low-probability event, the report’s “analysis is worthless.”

Still, advocacy groups long opposed to nuclear energy continue to compile “reports” projecting catastrophic consequences of a potential terrorist attack, painting pictures of hugely implausible scenarios. This report, and other such studies, should be considered in light of realistic and rational assumptions.

#### **NUCLEAR INDUSTRY SUPPORTS NUCLEAR SECURITY LEGISLATION**

The nuclear industry supports several legislative proposals from the NRC that would enhance its security efforts. The Energy and Commerce Committee of the House of Representatives considered and passed several of these proposals in 2003. The Senate Environment and Public Works Committee also has considered and passed several security proposals. The proposals include increasing the penalties for sabotage of a nuclear facility and making it a federal crime to bring an unauthorized weapon into one of our facilities. Although not included in these bills, the industry supports efforts to clarify the weaponry that can be used by our security forces, as well as their ability to use deadly force.

These proposals were the subject of the energy bill conference and many are now included in the energy bill conference report pending before Congress. The industry does not agree with every aspect of the proposals; however, it has supported passage of the energy bill, including the nuclear plant security provisions.

#### **POLICY IMPLICATIONS OF INCREASING NUCLEAR PLANT SECURITY REQUIREMENTS**

The nuclear energy industry urges Congress and other policymakers to take into account the NRC’s view that nuclear power plant security has been raised to a private entity’s limits. The industry agrees with this assessment. The determination of what is—and is not—a responsible level of overall security for our nation’s critical infrastructure is largely the purview of our government, not private industry. If Congress or the administration believes that protection against larger or more serious threats is necessary, then the industry urges consideration of the practical limits of what a commercial entity can and should offer. At some point, industrial security becomes national security.

The nuclear energy industry also urges Congress and other policymakers to consider greater policy implications arising from extensive security being provided at our plants. This security is top-rate and top-dollar. Nuclear power provides enormous benefits to our economy, our national

security and our environment. Security at our plants must be more than adequate, but not an unnecessary burden that only the nuclear energy industry must carry.

Finally, the nuclear industry urges Congress and other policymakers to consider whether resources are being properly utilized. The nuclear energy industry has responded effectively and rapidly to improve its security after Sept. 11, 2001. But, much of this response is attributable to the existence of a federal regulator, the NRC, with the ability to impose and enforce new security mandates. As such, the nuclear energy industry's security requirements have dramatically exceeded those for any other major industrial sector—including industries that do not have a regulator with authority similar to the NRC's. A rational homeland security policy identifies targets based upon risk and allocates resources appropriately. Risk assessments by notable security authorities have found—based on past terrorist targets—that nuclear plants are hardened targets and are considerably less likely to be the focus of terrorist attacks.

In summary, our defenses were exceptional prior to Sept. 11, and they are even better today. It is highly unlikely that attackers could successfully breach security at a nuclear power plant and even more unlikely they could produce a release of radiation that would endanger the residents near the plant. In addition, security at our nuclear power plants is not static. We are constantly reviewing and reevaluating our security programs. Consequently, America's nuclear energy industry will continue to play its role as a leader and model for protecting our country's critical infrastructure.

## Nuclear Power Plant Security

September 2004

### Key Facts

■ The defense-in-depth philosophy used in the construction and operation of nuclear power plants provides high levels of protection for public health and safety.

■ The Nuclear Regulatory Commission has always imposed on nuclear power plants the highest security standards of any American industry. The industry meets or exceeds these requirements in all areas. All commercial nuclear power plants have well-armed and highly trained security forces—some 8,000 officers—that are routinely drilled and tested.

■ Since Sept. 11, 2001, security has been significantly strengthened. The NRC in February 2002 and again in April 2003 ordered enhanced security by the industry.

■ The industry has added about 3,000 officers and upgraded physical security over the past three years. The industry has spent an additional \$1 billion on security since September 2001.

■ Access to nuclear power plants, tightened since Sept. 11, is controlled by a physical barrier system and security officers

who search all entering vehicles and people. All workers entering plant operating areas also must pass through sensitive metal and explosives detection equipment.

■ Plant operators also have installed additional vehicle barrier systems to protect against vehicle bombs.

■ The industry coordinates with the NRC, Department of Homeland Security and intelligence agencies on the assessment of potential threats and the specific actions by industry security forces in the event of a credible threat against a commercial nuclear facility.

■ All commercial nuclear plants have emergency response procedures and contingency plans in the event of a plant accident or terrorist event. These procedures, reviewed and improved following Sept. 11, are evaluated every two years during extensive drills involving plant personnel and local police, fire and emergency management organizations. NRC and Federal Emergency Management Agency (FEMA) expert teams evaluate these drills.

### Plant Security Meets All Federal Requirements

The nuclear energy industry is one of the few whose security program is regulated by the federal government. The NRC's requirements for nuclear power plant security are predicated on the need to protect the public from the possibility of exposure to radioactive releases caused by acts of sabotage. Intelligence information and incidents around the world are analyzed to ensure plant protection regulations are updated to reflect potential threats.

The NRC's security regulations are designed to ensure that the industry's security force can protect against specific ground-based threats. The threat against which the industry must defend is characterized as a suicidal, well-trained paramilitary force, armed with automatic weapons and explosives, and intent on forcing its way into a nuclear power plant to commit radiological sabotage. Such a force may have the assistance of an "insider," who could pass along information and help the attackers. The presumed goal of such an attack would be the release of radioactive material from the plant.

The NRC's "design basis threat" provides a foundation for developing defensive



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response strategies that cover a variety of situations. The NRC bases the design basis threat on technical studies and information received from intelligence experts and federal law enforcement agencies. It is reviewed by the agency twice a year.

Over the past three years, the NRC has twice raised the threat level against which nuclear plants must provide protection. In doing so, the NRC has assumed an increased number of possible attackers and weapons capabilities.

Many industry security elements are considered “safeguards” information, which means they are controlled on a “need-to-know” basis. Clearly, plant protection capabilities and response strategy should be controlled and protected from public disclosure to avoid compromises that might benefit a potential adversary.

## Defense-in-Depth Against Potential Threats

The FBI considers security forces and infrastructure at nuclear power plants formidable and considers nuclear power plants difficult to penetrate.

In addition, the defense-in-depth features that protect the public from radiological hazard in the event of a reactor incident also protect the plant’s fuel and related safety systems from attempted sabotage. The design of each plant emphasizes the reliability of plant systems, redundancy and

diversity of key safety systems, and other safety features to prevent incidents that could pose a threat to public health and safety.

Steel-reinforced concrete containment structures protect the reactor. Redundant safety and reactor shutdown systems have been designed to withstand the impact of earthquakes, hurricanes, tornadoes and floods. Areas of the plant that house the reactor and used reactor fuel also would withstand the impact of a widebody commercial aircraft, according to peer-reviewed analyses by EPRI, a Palo Alto, Calif.-based research organization. Operations personnel are trained in emergency procedures that would be used to keep the plant safe from a sabotage attempt.

A two-day national security exercise conducted by the Center for Strategic and International Studies in 2002 found that nuclear power plants would be less attractive targets to terrorist organizations because of the industry’s robust security program. The exercise was designed to explore difficulties and reveal vulnerabilities that might arise if the nation were faced with a credible, but ambiguous, threat of a terrorist attack on American soil.

“Silent Vector” was developed and produced by CSIS in partnership with the ANSER Institute for Homeland Security and the Oklahoma City National Memorial Institute for the Prevention of Terrorism. Potential

targets included refineries, large liquefied natural gas or liquefied petroleum gas storage operations, pipeline infrastructure, petroleum terminals, nuclear power plants, chemical operations and dams.

CSIS President John Hamre said that nuclear power plants “are probably our best-defended targets. There is more security around nuclear power plants than anything else we’ve got ... One of the things that we have clearly found in this exercise is that this is an industry that has taken security pretty seriously for quite a long time, and its infrastructure, especially against these kinds of terrorist threats, is extremely good.”

David McIntyre, former deputy director of the ANSER Institute for Homeland Security, added that “during the eight months of research that went into this, there were some issues like that [communication and coordination] that turned out not to be as great as we thought. And the nuclear industry was one of those that turned out to be much better connected—much more progressive, frankly—than I’d anticipated when we began the research.”

## Security Increased Since Sept. 11, 2001

Immediately after the events of Sept. 11, 2001, security at every nuclear power plant was placed on its highest level. Nuclear plant security now is consistent with Homeland Security threat levels.

# Nuclear Power Plant Security

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As a result, access to the plants is more strictly controlled; the defensive perimeters have been extended and reinforced, and security forces and capabilities have been augmented. Further, coordination with law enforcement, the intelligence community and the military has been enhanced. At some plants, these efforts have been supplemented by National Guard, U.S. Coast Guard, state police or other forces.

In February 2002, the NRC formalized many of the enhancements to security that the industry had already implemented. The agency subsequently issued new requirements further restricting access authorization.

In April 2003, the NRC issued rules limiting the working hours of security personnel and requiring increased training including weapons proficiency. All U.S. nuclear power plants submitted plans for meeting the NRC's additional security requirements relating to working hours, training and other areas in April 2004. They will implement these plans by October 2004.

**Site Security Measures.** All commercial nuclear plants have established extensive security measures. Plant operators and the NRC inspect these measures and test them in drills to uncover any vulnerability. Security measures include:

- physical barriers and illuminated detection zones

- approximately 8,000 well-trained and well-equipped armed security officers at 64 sites
- surveillance and patrols of the perimeter fence
- intrusion detection aids (including several types of detection fields, closed-circuit television systems and alarm/alert devices)
- bullet-resisting barriers to critical areas
- a dedicated contingency response force.

All threats will be countered with dedicated, tactically trained, well-armed security officers who collectively determine the nature of a threat, assess its magnitude and take aggressive steps to deter the threat.

**Controlled Access.** Access to a nuclear power plant requires passage through a larger "owner-controlled area" surrounding the plant. Access to specific parts of the plant is controlled by physical barriers and security officers.

Access to an interior fenced area—the protected area, where the reactor building is located—is controlled by security officers and physical barriers. Vehicle barriers and/or other physical boundaries ensure that the protected area of the plant cannot be breached by a direct vehicular assault or by detonation of a vehicle bomb. All vehicles, personnel and material entering the protected area first must be

thoroughly inspected by security officers to ensure that no weapons, explosives or other such items are brought onto the plant site.

Access to the "protected area" of the plant is controlled through the use of physical barriers, intrusion detection equipment, closed-circuit surveillance equipment, a designated isolation zone and exterior lighting. Access to the inner areas of the plant where vital equipment is located also is controlled through the use of physical barriers, locked and alarmed doors, and card-reader or hand geometry access control systems.

The barriers are substantial enough to effectively delay entry in order to allow for an effective armed response by plant security forces. Within the protected zone, access to all vital areas of the plant is even more secure. This access may be controlled by a security officer or provided by computer-controlled "key-card" access systems. Plant employees must have a documented need prior to gaining access to each vital area, and their movements are tracked by key-card access points throughout the vital area.

**Reactor Operators Act in Concert With Security.** Reactor operators train frequently to be sure they can respond to a range of unusual events. Plant operators have emergency procedures in place specifically for security situations, including automatic shutdown of the



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reactor in the event of an attack. Emergency planning and public notification systems support protection of public health and safety. The NRC periodically evaluates these plans during exercises or drills, which may also involve local police, fire and emergency management organizations.

## Protecting Against An Insider Threat

All nuclear power plants have programs that reduce the potential for threats from plant personnel, or “insiders.” These include authorization criteria for those allowed unescorted access to the plant’s protected area and “fitness-for-duty” programs to deter drug and alcohol abuse.

Strong behavioral observation programs are in place requiring personnel to be trained to observe and report behavior that may be a potential threat to the normal operation of a nuclear power plant. In addition, many companies provide team-work development programs that promote commitment and accountability in the work force.

**Access Authorization.** Before new nuclear plant employees or contractor employees are allowed unescorted access to the protected area, they must pass several tests and background checks to determine whether they are trustworthy and reliable. These tests include drug and alcohol screening, psychological evaluations, plus a check with former employers, education records, criminal histories (through the FBI) and credit histories.

**Fitness-for-Duty Programs.** Companies that operate nuclear power plants demand and ensure that personnel perform their duties in a safe, reliable and trustworthy manner, and are not under the influence of legal or illegal substances, or mentally or physically impaired from other causes, that would adversely hinder their ability to competently perform their duties. Employees who have unescorted access to the plant’s protected area must maintain their fitness-for-duty. The NRC requires companies to conduct random drug and alcohol testing on their employees. As a result, at least half of all employees are tested annually.

## Behavioral Observation.

Employees with unescorted plant access are subject to continual behavioral observation programs. Behavioral observation is conducted by all personnel who have been trained in behavioral observation. Behavioral observation is designed to detect individual behavioral changes, which, if left unattended, could lead to acts detrimental to public safety. Employees are offered counseling if they have job performance problems or exhibit unusual behavior. Similarly, anyone who appears to be under the influence of drugs or alcohol is immediately removed from the work area for evaluation.

*This fact sheet is also available at [www.nei.org](http://www.nei.org), where it is updated periodically.*

## Post-Sept. 11 Improvements in Nuclear Plant Security Set U.S. Industry Standard

August 2004

### Key Facts

■ Nuclear plants are the most secure facilities in the U.S. industrial infrastructure.

■ The nuclear energy industry, working with the Nuclear Regulatory Commission, has implemented additional security measures at nuclear facilities since Sept. 11, 2001.

■ Recent studies and exercises have confirmed that nuclear facilities are well defended and difficult for terrorists to penetrate.

### Setting the Standard for Industrial Security

The nuclear industry responded quickly and effectively to the events of Sept. 11. Security at nuclear plants, already the most secure facilities in the U.S. industrial infrastructure, was bolstered and has remained at a heightened level of alert.

Security forces at nuclear plants were increased by 33 percent to approximately 7,000 officers at 67 sites. By the end of 2004, the industry will have spent an additional \$1 billion in security-related improvements since September 2001.

In 2001, the industry averaged \$5 million per site on security-related expenditures. Security expenditures increased to \$7.3 million per site in 2003.

The industry, working with the NRC, instituted additional security measures since Sept. 11, such as:

- extending and fortifying security perimeters
- increasing patrols within security zones
- installing new barriers to protect against vehicle bombs
- installing additional high-tech surveillance equipment
- strengthening coordination of security efforts with local, state and federal agencies to integrate approaches among the entities—a position the industry continues to support.

In February 2002, the NRC formalized many of the security enhancements that the industry had implemented since Sept. 11. The NRC has enhanced its requirements to further restrict access at nuclear plants.

In April 2003, the NRC issued new orders that limit the hours security personnel may work each week. In addition, the NRC increased the training requirements for nuclear plant security officers, including training in weapons proficiency.

Since Sept. 11, the NRC has twice significantly increased the definition of the threat against which nuclear plants must provide protection. As a result, nuclear plants now are able to defend against a greater number of attackers, armed with more weapons than ever before.

Working with the NRC, the industry continues to examine ways to improve security at all U.S. nuclear facilities at every level.

### Studies Confirm Strength Of Nuclear Plant Security

A two-day national security exercise conducted by the Center for Strategic and International Studies (CSIS) in 2002 found that nuclear plants would be less attractive than other potential targets to terrorist organizations because of the industry's robust security programs. The exercise was



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designed to explore difficulties and reveal vulnerabilities that might arise in the event of a credible, but ambiguous, threat of a terrorist attack on American soil.

At the conclusion of the exercise, CSIS President John Hamre said that nuclear power plants “are probably our best-defended targets. There is more security around nuclear power plants than anything else we’ve got.”

Peer-reviewed analyses conducted by EPRI, a Palo Alto, Calif.-based research firm, revealed that structures that house the reactor and nuclear fuel facilities would be protected against a release of radiation even if struck by a large commercial jetliner.

State-of-the-art computer modeling techniques determined that typical nuclear plant containment structures used fuel storage pools, fuel storage containers and used fuel transportation containers would withstand a potential impact despite some concrete crushing and bent steel. In all cases, public security would be protected.

*More information on NRC security initiatives since Sept. 11 is available at [www.nrc.gov](http://www.nrc.gov).*

*This fact sheet is also available at [www.nei.org](http://www.nei.org), where it is updated periodically.*